COLORADO DIVISION OF WILDLIFE DIVISION REPORT NO. 6

CONSTRUCTION AND USE OF THE SALT PLAINS DUCK TRAP IN COLORADO

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APRIL 1976

State Publication Code DOW-R-D-6-'76 Price $1.00

CONSTRUCTION AND USE OF THE SALT PLAINS DUCK TRAP IN COLORADO[1]

Many of the migratory bird research programs conducted by the Colorado Division of Wildlife have involved the capture and banding of large numbers of waterfowl. Two projects, the San Luis Valley Cooperative Mallard Investigation initiated in the summer of 1963 and the Investigation of Mallard Management Units of Eastern Colorado begun in the winter of 1963–64, required the development of portable duck-trapping equipment. Concurrent with the initiation of these studies was the introduction of the "Salt Plains" type duck trap to Colorado by Howard D. Funk, then a wildlife researcher. The Salt Plains trap was apparently first developed and used at the Salt Plains National Wildlife Refuge in north-central Oklahoma (Addy 1956). Colorado has made numerous modifications of materials used in construction of the trap, but the basic design has remained the same. The Colorado version has proven to be very efficient when properly used.

This leaflet provides lists of materials and directions for fabrication, setting up, site selection, and operation of the duck trap (Fig. 1).

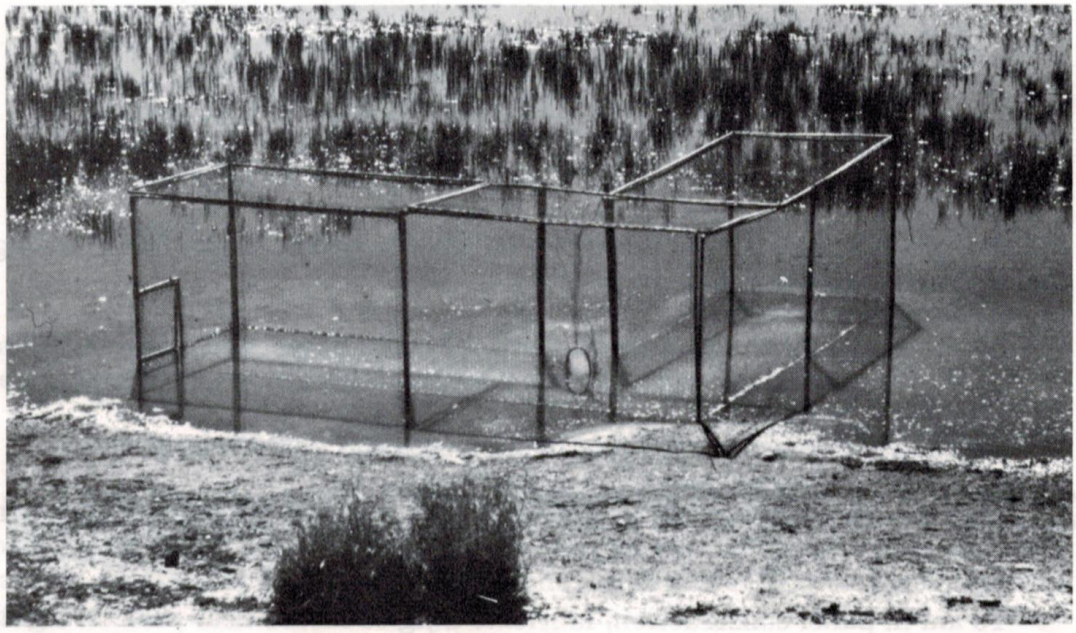

Fig. 1. Salt Plains duck trap, set and ready for capture. (Photo by M. Szymczak)

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[1]*Contribution from Federal Aid Project W-88-R*

TRAP CONSTRUCTION AND ERECTION

The trap consists of 11 individual rectangular panels constructed of frames of tubular thinwall electrical conduit covered with poultry netting. The approximate lengths of the 11 panels are as follows: six 6-ft. panels; two 7-ft. panels; two 4-ft. panels; and one 8-ft. panel. Each panel is about 3 ft. 8 in. in width, thus permitting the use of standard 4-foot-wide poultry netting.

The trap has an entrance funnel constructed of wood lath, poultry netting, and a metal rod, and one 4-ft. panel has a small outlet door for removing the ducks. The entire trap weighs approximately 100 lbs. and can easily be carried by two people.

Trap construction requires the use of three special tools, the conduit cutter, crimper, and the stapling pliers, which currently retail for about $40.00. The materials for one trap will cost $75.00 retail. A savings of about 40 percent can be obtained by purchasing materials in quantity from a wholesale dealer.

Panel Fabrication

Tools

½-in. conduit cutter
conduit fitting crimper
Bostitch P7 stapling plier
sheet-metal shears
screwdriver
12-in. pipe wrench

Materials (one trap)

22 10-ft. lengths ½-in. thinwall conduit
28 ½-in. thinwall conduit couplings (crimp type)
six ½-in. thinwall conduit connectors (crimp type)
two ½-in. galvanized pipe tee's
70 ft. of 1-in.-mesh galvanized poultry netting, 48 in. wide
½ box Bostitch SR 8062 staples (hog ring type)
two 2-in. radiator hose clamps

To minimize waste, cut the conduit, when required, into the following lengths in the following sequence:

1. 14 10-ft. lengths
2. one 10-ft. length into a 65-in. piece, a 34½-in. piece, and a 18½-in. piece
3. one 10-ft. length into a 53 3/8-in. piece, a 34½-in. piece, a 18½-in. piece, and a 13½-in. piece
4. four 10-ft. lengths into four 109-in. pieces and four 6½-in. pieces
5. two 10-ft. lengths into two 109-in. pieces

The above cuts should result in the following lengths of conduit: fourteen 120-in. pieces, six 109-in. pieces, one 65-in. piece, one 53 3/8-in. piece, two 34½-in. pieces, two 18½-in. pieces, one 13½-in. piece, and four 6½-in. pieces.

To aid in panel construction, fabricate a jig to insure near-perfect, right-angle bends in the conduit at the right locations. The jig is made of a 60-in. length of ¾-in. pipe and a 1½ x 1/8-in. piece of angle iron at least 6 in. long. Drill ¼-in. holes through the pipe at the following distances from one end of the pipe: 8 1/4, 10 1/8, 12 5/8, 17 3/8, 18 5/8, 19 1/8, 20 3/16, 23 5/8, 24 5/8, and 53 1/2 inches. Number the holes 10 through 1, respectively (i.e. hole at 8 1/4 in. is 10, hole at 10 1/8 in. is 9, etc.). With hole number 10 on the right end of the

pipe, weld the angle iron to the right end with one side flush with the end of the pipe and the other side flush with the side of the pipe, as indicated in Figure 2, rear view. Grind the angle iron to provide a seat for the pipe, as shown. Weld the angle iron to the pipe so that the holes in the pipe are *not* perpendicular to the longitudinal axis on the angle iron. In use, the jig should be bolted firmly to a flat workbench, using U-bolts and a small bolt in the angle iron, as shown in Figure 2, front view.

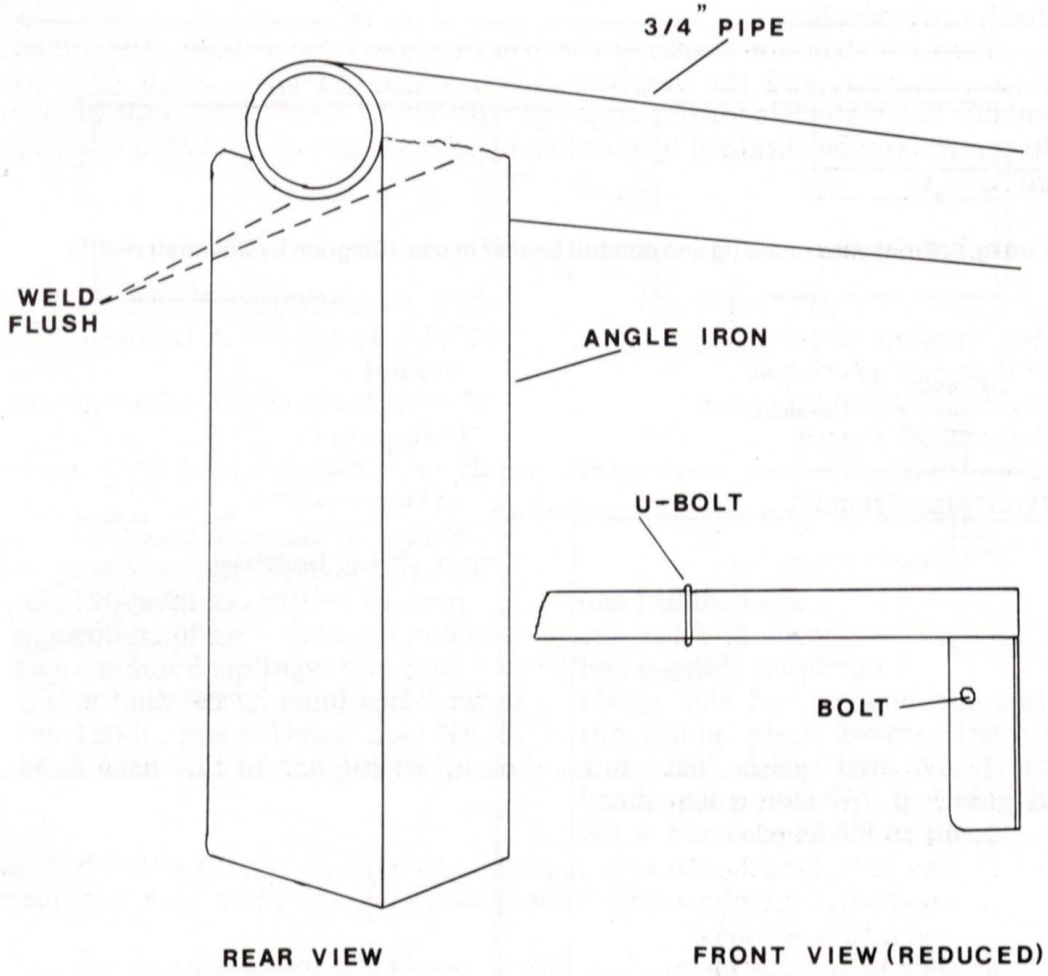


Fig. 2. Bending jig. Rear view shows recessed seat in angle iron for ¾-in. pipe and appropriate welds; reduced front view shows jig bolted in place for operation. (Diagram by Shannon Heath)

A simple device to aid in bending the conduit can be constructed with a 24-in. piece and 4-in. piece of ¾-in. pipe. Cut the 4-in. piece longitudinally so that about ⅔ of the pipe remains, and weld the 4-in. piece to the 24-in. piece (Fig. 3). Use the bender as shown in Figure 4, to insure good, consistent right-angle bends in the conduit.

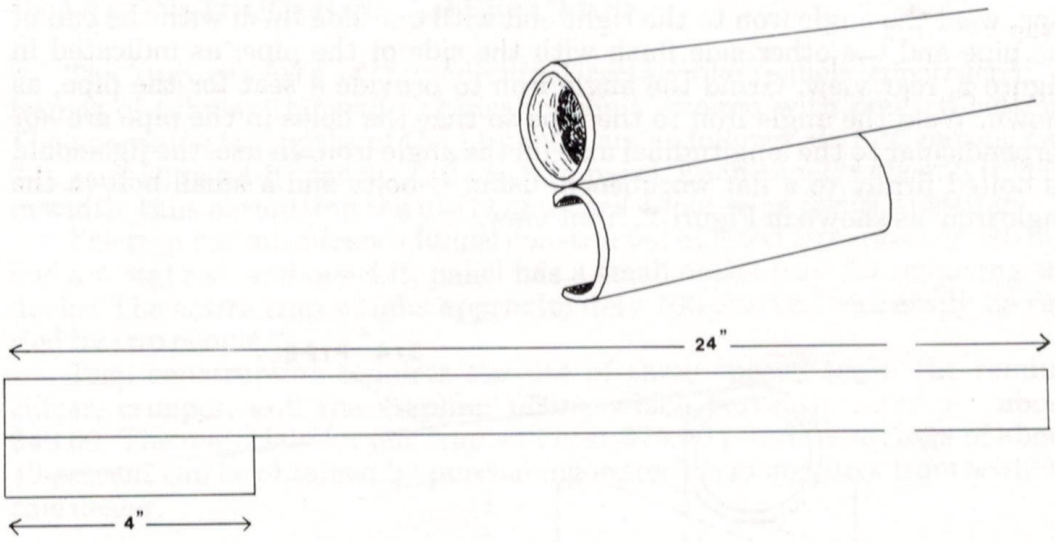


Fig. 3. Front view of the jig and conduit bender in use. (Diagram by Shannon Heath)

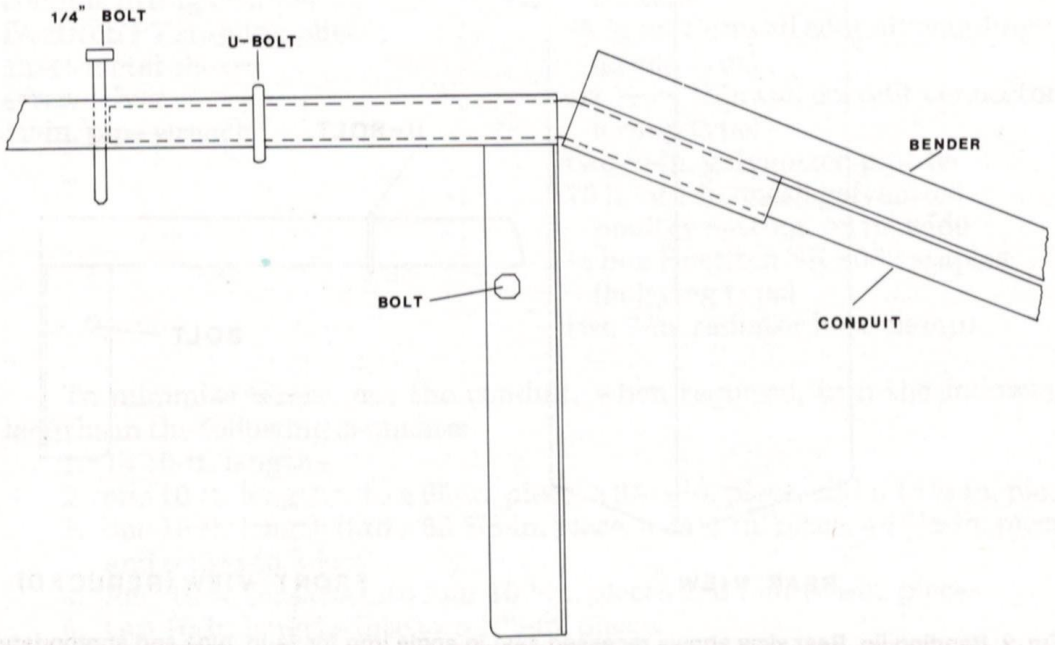
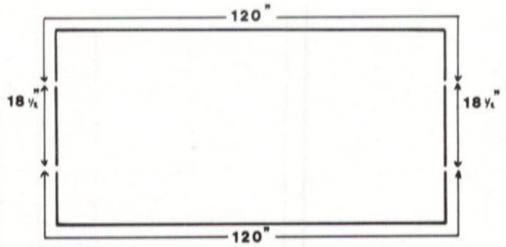


Fig. 4. The conduit bender, showing the approximate amount of 4-in. pipe that should be removed, and correct placement of the altered pipe. (Diagram by Shannon Heath)

With the jig bolted in place and a ¼-in. bolt as a stopper in the pipe, you are ready to construct the conduit panels. Place the conduit stopper in the hole, as indicated below, insert the conduit in the angle-iron end of the pipe until the conduit is against the stopper, and make the bend. A certain bending sequence is required for some pieces, as indicated below. Use conduit couplings for all joints, except for the outlet door frame in the 4-ft. panel.

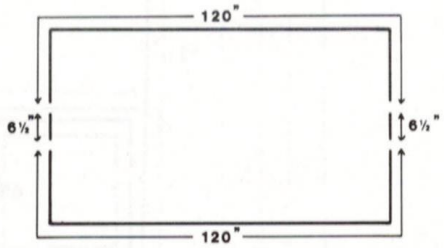
8-ft. panel

two 120-in. pieces
two 18½-in. pieces
four conduit couplings
Using hole No. 8, bend each end of the 120-in. pieces.



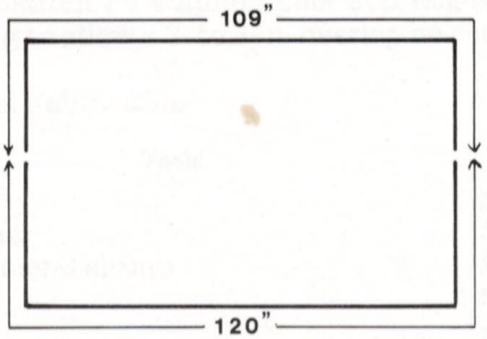
7-ft. panel

two 120-in. pieces
two 6½-in. pieces
four conduit couplings
Using hole No. 6, bend each end of the 120-in. pieces.



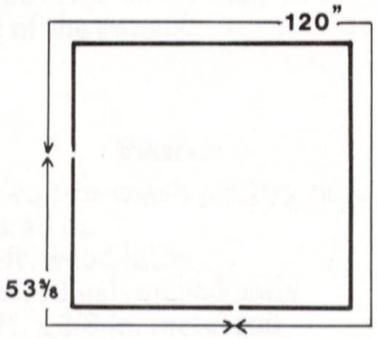
6-ft. panel

one 120-in. piece
one 109-in. piece
two conduit couplings
Using hole No. 2, bend each end of the 120-in. piece. Using hole No. 5, bend each end of the 109-in. piece.



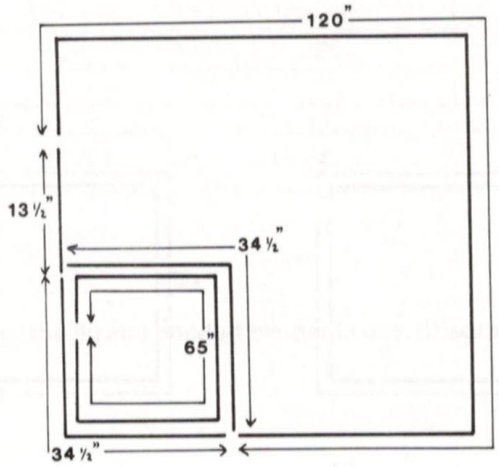
4-ft. panel (no door)

one 120-in. piece
one 53 3/8-in. piece
two conduit couplings
Using hole No. 3, bend one end of the 120-in. piece; reverse the piece and bend, using hole No. 1; then bend, using hole No. 9. Using hole No. 4, bend the 53 3/8-in. piece.



4-ft. panel (with door)

one 120-in. piece
one 13½-in. piece
two 34½-in. pieces
one 65-in. piece (door)
one conduit coupling
six conduit connectors
two galvanized pipe tee's
two 2-in. radiator hose clamps



Using hole No. 3, bend one end of the 120-in. piece; reverse the piece and bend, using hole No. 1; then bend, using hole No. 9. Using hole No. 7, bend each 34½-in. piece.

Using hole No. 2, bend one end of the 65-in. piece; then bend, using hole No. 10; then reverse the piece and repeat, bending at hole No. 2 and then hole No. 10.

Assemble the door frame, using connectors and tee's as indicated in Figure 5. Do not attach small door to panel, using hose clamps as hinges, until the poultry netting is in place on both the 4-ft. panel and the door.

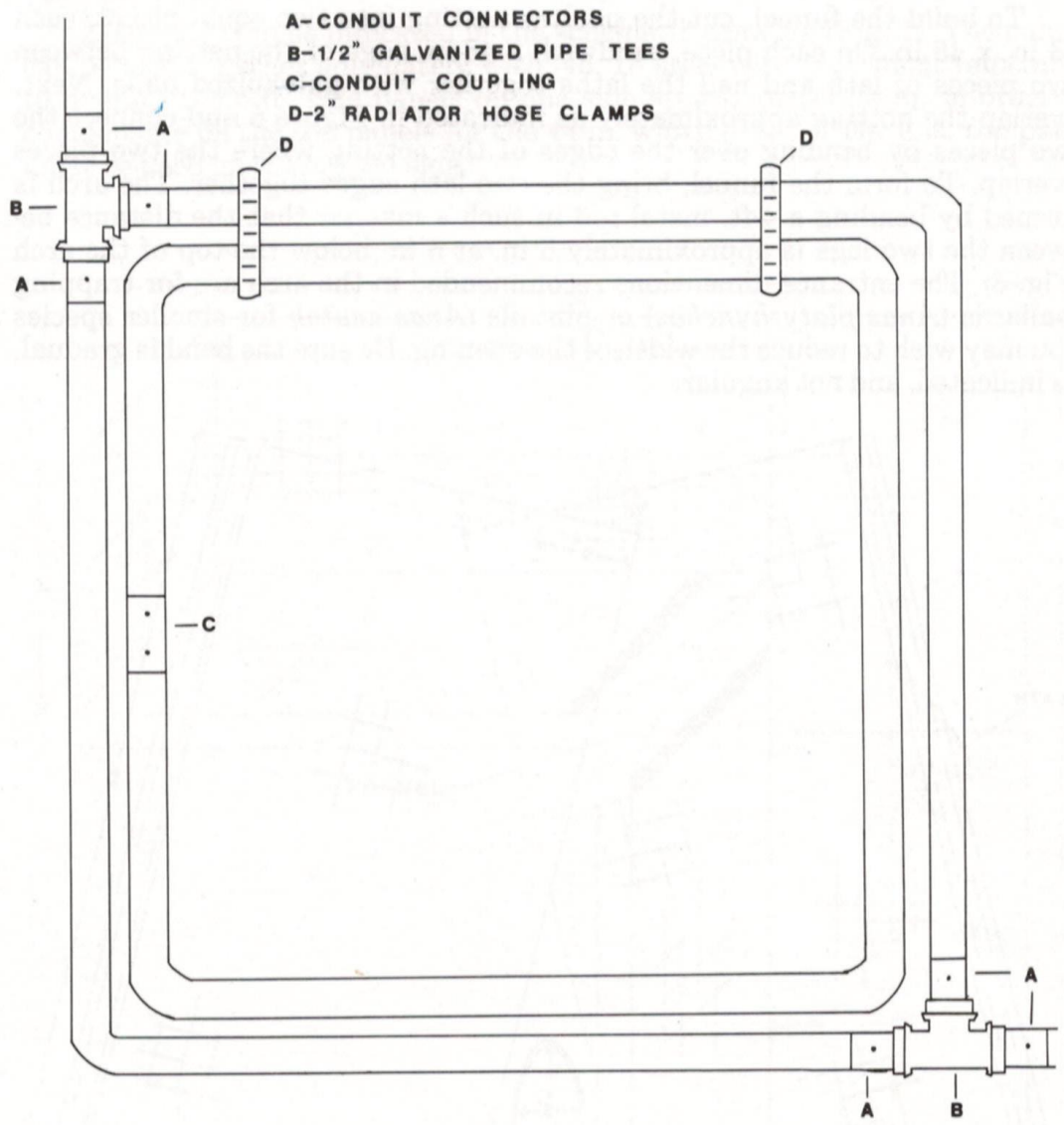


Fig. 5. Assembled outlet door and frame in 4-ft. end panel. (Diagram by Shannon Heath)

Attach the 1-inch-mesh, 48-inch-wide poultry netting to the panels, using the Bostitch P7 stapling plier and hog-ring-type staples. Be sure to cut the netting to allow a 2- to 3-in. overlap on each end of the panels.

Funnel Fabrication

Tools	Materials
pliers	one piece 1-in.-mesh poultry netting, 56 in. x 48 in.
hammer	four 4-ft. wood laths
sheet metal shears	two doz. #6 galvanized nails
	one 4-ft. x 3/8-in. metal rod

To build the funnel, cut the poultry netting into two equal pieces, each 28 in. x 48 in. On each piece, sandwich a 48-in. edge of the netting between two pieces of lath and nail the laths together with galvanized nails. Next, overlap the netting approximately as indicated in Figure 6 and connect the two pieces by bending over the edges of the netting where the two pieces overlap. To form the funnel, bring the two lath edges together. The arch is formed by bending a 4-ft. metal rod in such a manner that the distance between the two legs is approximately 5 in. at 5 in. below the top of the arch (Fig. 6). The entrance dimensions recommended in the arch are for trapping mallards (*Anas platyrhynchos*) or pintails *(Anas acuta);* for smaller species you may wish to reduce the width of the opening. Be sure the bend is gradual, as indicated, and not angular.

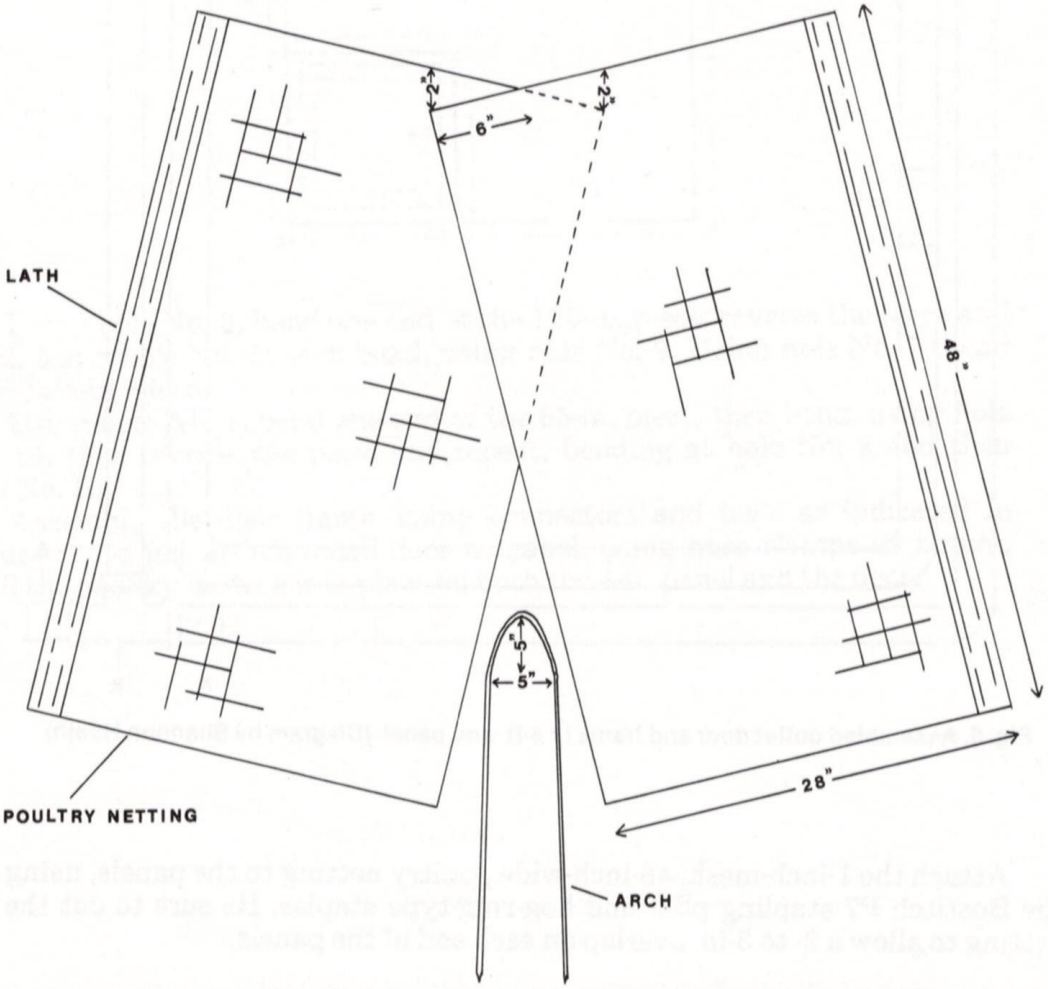


Fig. 6. Basic parts of the funnel, showing the approximate overlap of poultry netting in assembling and the recommended shape of the metal arch. (Diagram by Shannon Heath)

Catch Box

Another essential item is the catch box. In Colorado we have used various materials for catch box construction and we are still experimenting with the design. Currently, we are using a box 20 x 20 x 32 in. constructed of thinwall conduit and welded wire fencing with ¼-in. plexiglass sliding door.

Trap Erection

Erect the trap as indicated in the schematic drawing (Fig. 7). The panels can be held together adequately with No. 18 steel wire. You must remember to overlap the 6-ft. side panels on one side approximately 4 in. in order to compensate on the top panels for the 44-in. width (Fig. 7). The 8-ft. top panel must be used on the lapped side.

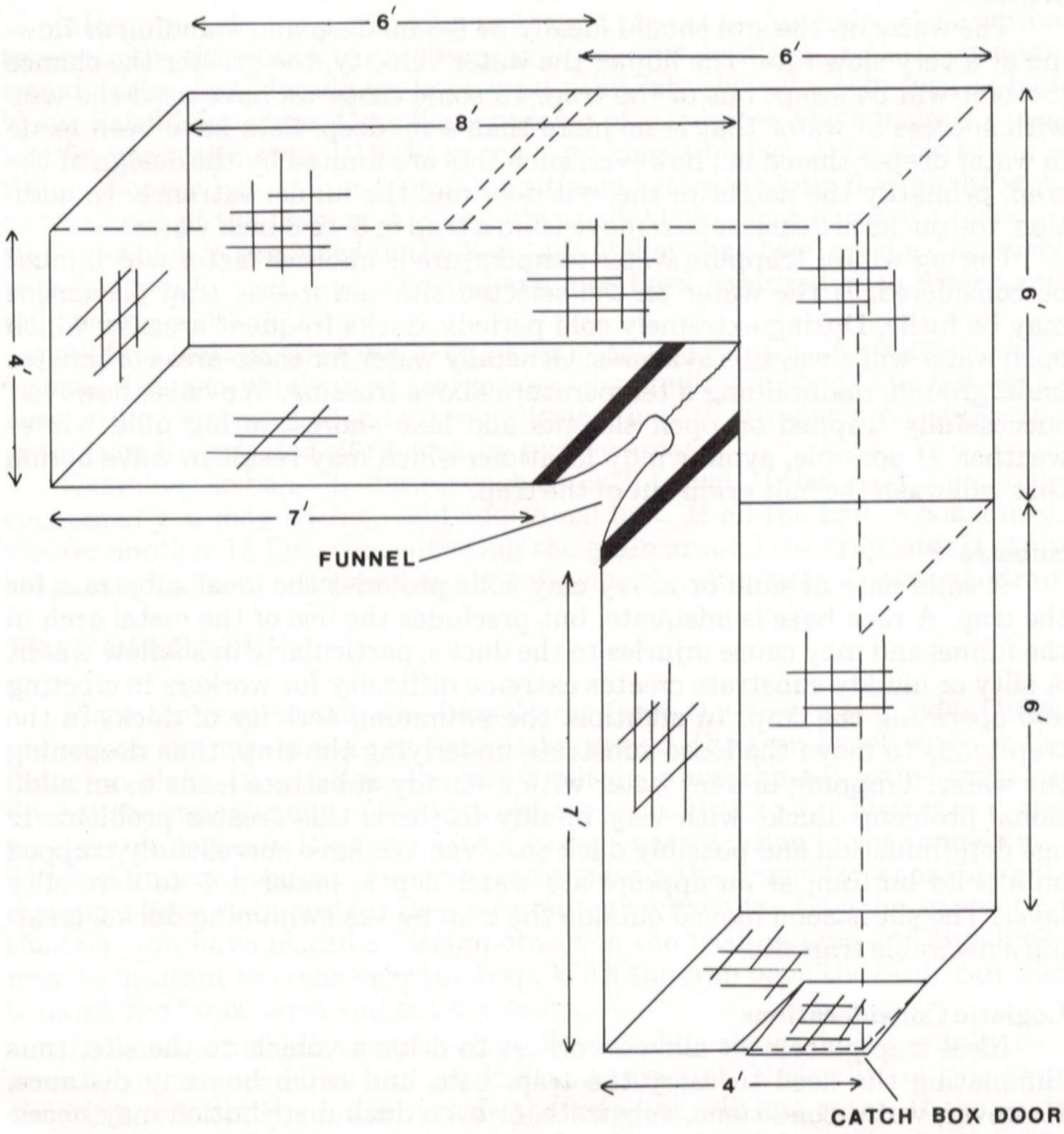


Fig. 7. Diagram of assembled modified Salt Plains duck trap. (Diagram by Shannon Heath)

The lath sides of the funnel are wired vertically to the 7-ft. panels; the metal arch, after being woven through the wire at the entrance, is then driven into the ground. The top of the arch should be approximately 4 in. from the surface of the water.

SITE SELECTION

The first prerequisite to successful trapping is the availability of the target species. This fact has sometimes led to the use of Salt Plains traps on sites which are far less than ideal for trapping. We shall describe the ideal conditions, and then describe the limits within which they may be effective.

Water

The water on the site should ideally be 6-8 in. deep and standing or flowing at a very slow rate. The higher the water velocity, the greater the chance the bait will be swept out of the trap. In some cases we have used the trap with success in water that is no more than 4 in. deep. Sets have been made in water deeper than 8 in.; however, such sets are limited by the design of the trap, primarily the height of the exit door and the funnel entrance. In addition, the ducks are easiest to remove from a trap in 6- to 8-inch water.

During winter trapping water temperature is another factor which must be considered. If the water on the selected site can freeze, trap placement may be futile. During extremely cold periods, ducks frequent areas in which open water will always be available. Generally water for these areas originates underground, maintaining a temperature above freezing. We have, however, successfully trapped on open sloughs and lake shores during mild winter weather. If possible, avoid windy locations which may result in wave action that will wash the bait grain out of the trap.

Substrate

A solid base of sand or heavy clay soils provides the ideal substrate for the trap. A rock base is adequate, but precludes the use of the metal arch in the funnel and may cause injuries to the ducks, particularly in shallow water. A silty or muddy substrate creates extreme difficulty for workers in erecting and operating the trap. In addition, the swimming activity of ducks in the trap tends to move the loose substrate underlying the trap, thus deepening the water. Trapping in 4-in. water with a muddy substrate leads to an additional problem—ducks with very muddy feathers; this creates problems in age determination and possibly duck survival. We have successfully trapped on a solid bottom, at an appropriate water depth, under a 4- to 6-in. silty layer. The silt is soon moved outside the trap by the swimming ducks, creating a desirable trap site.

Logistic Considerations

Ideal trap placement allows workers to drive a vehicle to the site, thus eliminating the need to carry the trap, bait, and catch box any distance. However, water conditions, substrate, or even duck distribution may necessitate the trap be placed in areas that cannot be reached by vehicle. It is important that you be able to move the catch box to a dry location before banding the birds. If not, the birds may become extremely wet, making age determination difficult and increasing chances of mortality. The dry location can be a bank, sand bar, or even a boat if the trap is located on a large body of water.

Species Considerations

The type of trap location selected also depends upon the target species.

If possible, place your trap in the habitat in which they occur. For instance, during late summer trapping we found mallards and pintails to be very susceptible to the Salt Plains trap. So if, for instance, you wish to capture green-winged teal *(Anas crecca),* place your trap in an area used primarily by green-winged teal, avoiding areas frequented by mallards and pintails.

PREBAITING

After you select the trap site, your next step is to "prebait" the location to accustom the ducks to receiving grain at that location and attract additional ducks. In Colorado we have used primarily shelled whole corn as bait in our Salt Plains traps. Corn has a number of attributes which make it excellent for use in this trap: (1) light in color, making it highly observable to birds flying over the baited area, (2) comparatively heavy, making it more difficult to wash out of the trap, and (3) readily available in most parts of Colorado. Barley, which is produced in the San Luis Valley, has been used extensively with success in that area. Ducks have also been captured with wheat and milo maize.

At first baiting, use from 15 to 20 lbs. of grain (about ¾ of a 5-gal. bucket). Scatter the grain thinly over a large area surrounding the trap site, but not in deep water. You may wish to use additional bait to lure ducks by spreading grain from the selected site to nearby resting areas.

Examine the bait site during each 24-hr. interval. If the grain is partially consumed you may wish to add additional bait. If all the bait is consumed, scatter another 15 lbs., concentrating the grain around the trap site. If grain is again completely consumed on the following day, it is time to erect the trap.

TRAP OPERATION

Place the trap so that the funnel area faces the open-water side. Under normal conditions during the first 24-hr. period, the trap is set without the funnel in place. In addition, the small exit door and the 4-ft. panel entrance door at the opposite end of the trap remain open. Using a full bucket of grain, scatter two-thirds in the trap, with a heavy concentration in the funnel area. The remainder of the grain is scattered out from the funnel for a considerable distance. Be sure to scatter the grain out away from the trap, for in erecting the trap you have placed a foreign object in the feeding area and the ducks may be hesitant to come near the trap. With the trap open the birds can feed through the funnel area and out the doors.

If, when you check the trap the following day, the grain is partially consumed, you may wish to add an additional amount. Normally, in this case, the birds will eat the grain outside the trap but will not enter. If the grain inside the trap is gone, you are ready to trap.

Insert the funnel and close the two doors. Using a full bucket of grain, scatter three-fourths of it in the trap, being certain to fill the funnel area, both inside and outside the trap. Scatter the remainder of the grain out away from the funnel. An example of the set trap is shown in Figure 1 and, the following day, the scene in Figure 8 should be seen.

When you have captured ducks use very slow, deliberate movements around the trap to minimize the effect of your presence on the birds. The more the birds are excited, the more they splash, increasing wet feathers and

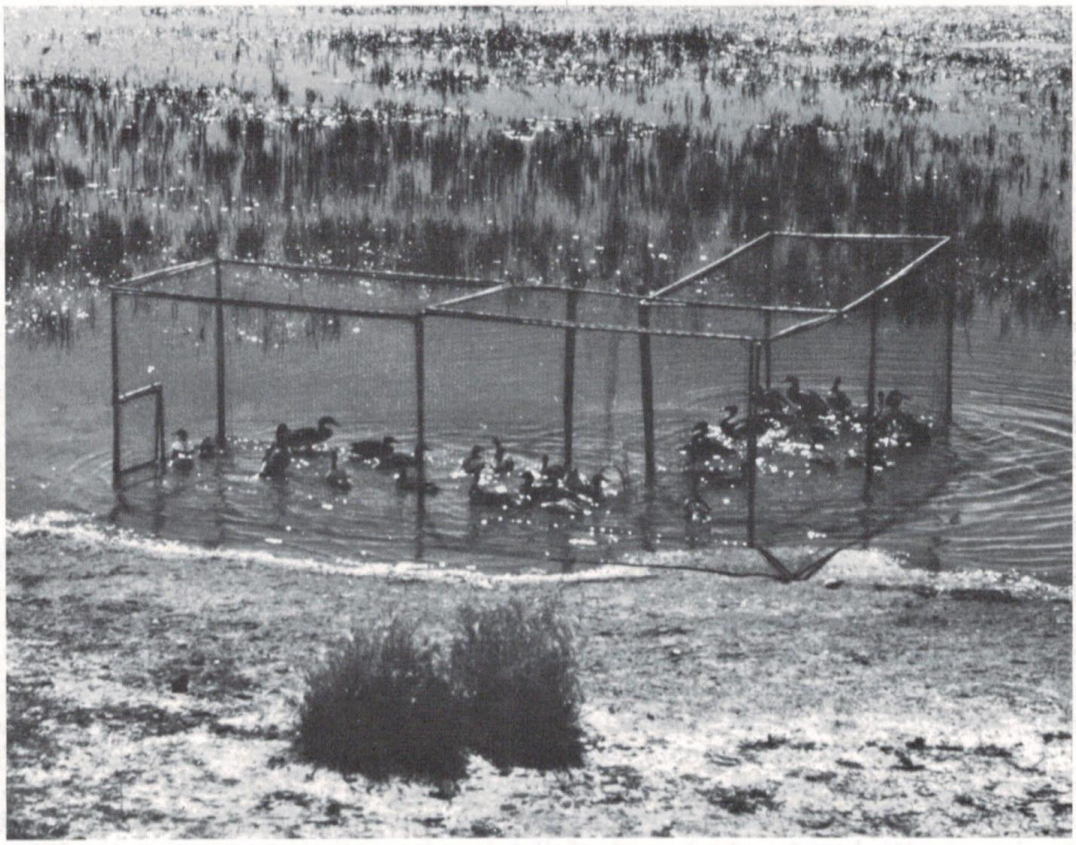


Fig. 8. Catch of ducks in Salt Plains trap. (Photo by M. Szymczak)

Fig. 9. The ducks are removed from the trap by driving them into the catch box. (Photo by M. Szymczak)

the associated problems.

To remove the ducks, place the open catch box at the small door in the 4-ft. panel. Enter the trap at the opposite end and drive the ducks into the box (Fig. 9). A two-man trapping team is most efficient. One man is outside the trap, and helps drive the ducks and slide the catch box door shut at the right time. A dip net with a handle no longer than 4 ft. and a hoop approximately 1½ ft. in diameter can be helpful in removing the last few ducks from the trap, particularly if the water inside the trap is deep enough to allow the birds to swim underwater. Two men should move the loaded catch box from the water as soon as possible. If you catch a large number of ducks in one setting, do not try to drive all the ducks into the catch box at one time. With a large number of birds you can fill the catch box several times without entering the trap.

Before rebaiting the trap, check: (1) the depth of the water in the trap; if it is too deep you may be able to move the trap slightly to eliminate the depth problem for the next catch; (2) ridging of the substrate in the funnel; ducks swimming inside the trap tend to create a ridge in the funnel, particularly in sandy soil; this causes the bait to wash into the trap, leaving no bait in the funnel outside the trap; and (3) ice on the trap; in cold weather, ice resulting from splashing ducks is formed on the trap. The ice should be broken away from the trap before rebaiting.

The length of time a trap will be productive varies, depending upon the objectives of the trapping operation. Some birds, once captured, will continue to return to the trap. Thus, the longer a trap remains at one site, the more previously-banded birds you will catch.

TRAPPING SUCCESS

The use of the Salt Plains trap in Colorado has resulted in the banding of nearly 100,000 ducks since 1963. Approximately two-thirds of that total has been mallards banded during late winter in eastern Colorado.

Summer banding, primarily in the high mountain park areas of Colorado, has resulted in the capture of nearly all species of ducks which occur in Colorado. However, we have been able to capture only mallards, pintails, green-winged teal, blue-winged teal *(Anas discors),* and cinnamon teal *(Anas cyanoptera)* in significant numbers. Even though other species have been present in the trapping area, we have not captured them at the rate at which they occur. Mallard and pintail are extremely susceptible to the Salt Plains trap; their abundance at most of our trapping locations, and their apparent aggressiveness, may explain why other species are not as readily captured. We have had some success trapping the smaller species such as teal by using a funnel with an opening too small to allow mallards to enter.

The male mallard seems far more susceptible to the trap than the female. This factor normally necessitates additional trapping to reach quotas for female mallards. Both sexes of pintail are captured at an equal rate.

In summary, the Salt Plains trap has provided an extremely efficient means to trap mallards and pintails in Colorado, and under certain conditions can capture all species of teal in significant numbers.

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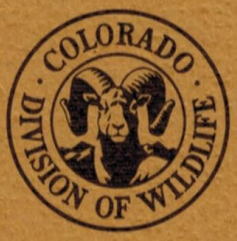
Addy, C. E. 1956. Guide to waterfowl banding. U.S. Fish and Wildl. Serv., Laurel, Maryland. (proc.) 84 unnumbered pp.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